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ORIGINAL ARTICLES.

FOREIGN BODIES IN THE ORBIT.*

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THE subject of foreign bodies in the orbit is both instructive and interesting. Since encountering the first case reported in this paper, I have searched carefully through the literature and tabulated all the cases up to date that have come to my notice. I, also, added cases Nos. 2 and 3, which occurred in my service at the Cincinnati Hospital.¹ It appears rather remarkable that there are no more cases of this class on record in the leading European and American journals of ophthalmology. It is important, however, to bear in mind that these cases are strictly limited to injuries of the orbit without involving the globe primarily. Literature is full of reported cases where foreign bodies have entered and passed through the orbit but in so doing the globe was partially or

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¹(I desire here to express my thanks to the Surgeon-General's Office, Washington, D. C., for sending to the Cincinnati Hospital Library books for reference, which I had no other means of consulting).

totally destroyed. This class of cases, it must be remembered, are entirely distinct from those reported in this paper.

1. Mr. P. A. Dearth, 44 years of age, barber by occupation, presented himself at my office for examination November 13, 1899.

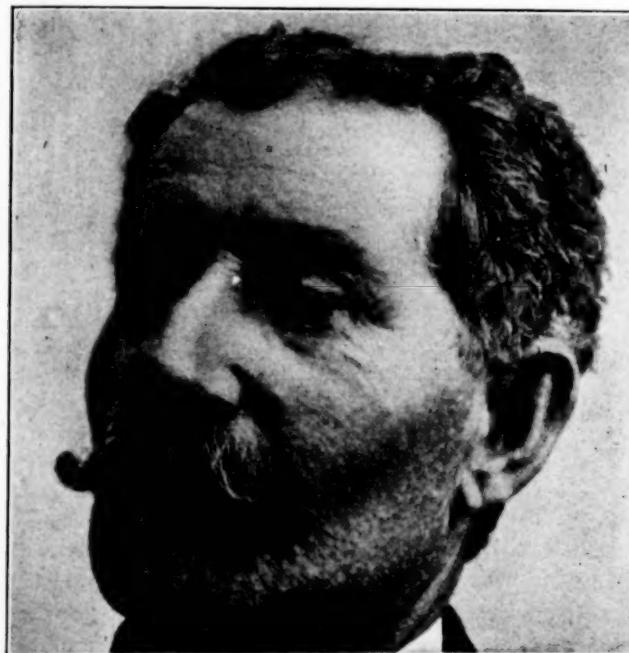


FIG. 1.—Showing appearance of eye ten days after operation.

History.—When a boy of 12, he fell and cut the left lower eyelid, which was followed by profuse haemorrhage; the injury was supposed to have been caused by striking upon a sharp stone, and the wound was dressed and attended by the family physician. Two or three weeks after the injury there presented in the granulating wound a substance which, when removed by a pair of forceps, appeared pinkish-white, and about the size of the tarsus in the lower lid; such it probably was, for when operating I failed to find the tarsus. When the wound healed, the lower lid became inverted and drawn down against the bony margin of the orbit, leaving the inferior part of the globe partly exposed; the cornea was, however, protected by the upper lid, and aside from epiphora

he suffered no annoyance from the injury for thirty-two years! It was only very recently that the eye began to become inflamed. When he presented himself for examination, I found the conjunctiva over the lower half of the globe swollen and hyperæmic; there was a superficial ulceration of the cornea about 3 mm. in diameter near the inner margin. Near the center of the inverted lower lid, at the point of adhesion to the bony orbit, there presented a small granulation about the size of two pin-heads. There was free lachrymation. The globe was otherwise normal.

Ophthalmoscopic examination was negative. Vision was normal for near and far. The movements of the globe were normal in all directions. Transillumination gave a bright pupillary reflex from the right side, but it was absent on the left, although the reflex was perfect over the antrum up to the orbital margin. I therefore concluded that there was necrosis of the floor of the orbit, with thickening of the surrounding tissues.

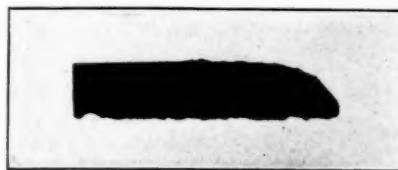


FIG. 2.—Appearance of the knife-blade after being imbedded in the orbit for thirty-two years.

Examination under anaesthesia revealed a hard mass beneath the globe. After splitting and dissecting loose the lower lid from its adhesions, the finger came in contact with a rough hard body, which I took to be necrosed bone, but on probing found it to be metal. Dissecting the soft tissues away, I obtained a firm hold with a pair of strong artery forceps, and by a to-and-fro movement, combined with a steady strong pull, extracted, much to my surprise, a knife-blade, 38 mm. long and 8 mm. broad. The direction of the blade was antero-posteriorly, and the broken end 5 mm. inside of the margin of the bony orbit. The blade was lying with its flat surface horizontally.

The average depth of the orbit from the bony margin to

the optic foramen is 40 mm. As the blade is 38 mm. long and was 5 mm. beyond the bony margin, the point of the knife-blade must have come in very close contact with the optic nerve, or, what is more likely, entered the sphenoidal fissure. When we remember that this fissure transmits the third, the fourth, the ophthalmic division of the fifth, and the sixth nerves, and the ophthalmic vein, it is quite remarkable that none of these were injured or irritated. Nature had surrounded the knife-blade by a sheath of connective tissue.

The lid was freed from all adhesions and the two halves were united by deep sutures, while the pocket formed by the removal of the knife-blade was packed loosely to favor healing from the bottom. The lower lid is now normal in appearance, excepting for a slight notch in the middle, but cicatricial changes will draw it into the wound and in the future it will require a more extensive plastic operation. The patient states that he was running with an open knife in his hand when the accident occurred, but had no idea that it was this which inflicted the wound, and the knife was supposed to have been lost during the excitement following the accident.

2. A. G., colored, 28 years of age. Admitted to the Cincinnati Hospital October 31, 1888.

History.—On the date of admission, while marching in a political procession, he was struck in the left eye and knocked down by what he supposed was a large piece of brick. He was stunned but did not lose consciousness. On admission to the hospital the following condition was found: Lids much swollen, lower lid slightly cut near inner canthus. The wound is lacerated, involving the lower canaliculus. There is a perpendicular tear in the conjunctiva near the caruncle; considerable exophthalmus, and motion of globe almost abolished. Pupil irregular, moderately dilated and fixed. Hæmorrhage into iris and anterior chamber. Vision reduced to perception of light.

Ophthalmoscopic Examination.—There are two fresh hæmorrhages on the surface of the optic disc. The nasal half of the fundus gives a grayish-white reflex due to oedema of the retina, which appears as if it might become detached.

November 5th. The following note was made in his his-

tory: Conjunctival wound healing slowly. Exophthalmus still marked. Haemorrhage into iris and anterior chamber with deposit on anterior capsule of lens. Motion of eye as follows: Inwards, absent; upwards, outwards, and downwards, motion only amounts to 3 mm.

November 7th. Eye very painful this morning. Upon arising from his bed, he was leaning forward and rubbing the eye to ease the pain, when a hard body fell upon the floor and rolled under the bed; whereupon the darky began to shout that his eye had fallen out of his head, but it proved to be only a round, leaden bullet, 12 mm. in diameter.

Examination of the eye after the spontaneous delivery of the bullet: Exophthalmus still marked but has been reduced 4 mm. The center of the cornea can now move 5 mm. inwards past the median line. Movement downward as before; but upward and outward much improved. A probe was passed through the wound in the conjunctiva backward an inch or more, liberating a small quantity of pus. The pupil was dilated and fixed. Since the bullet fell out the pain has entirely disappeared.

November 13. Only very slight exophthalmus remains and the motility of the globe is nearly normal. On fixation the injured eye deviates slightly upwards.

November 18. Ophthalmic examination. The haemorrhages have disappeared from the disc, also the oedema of the retina. Pupil beginning to contract. There are several large floating opacities in the vitreous. The movements of the globe are normal, excepting a slight insufficiency of convergence. Vision equals counting fingers at 2 feet. Discharged to the out-door clinic.

3. J. M., Italian foreman, 29 years of age. Admitted to the Cincinnati Hospital August 29, 1889.

The patient had been stabbed in the eye by a discharged workman, with an ordinary sheath or hunting knife, with such force that it could not be withdrawn and was still in *situ* when the patrol wagon brought the patient to the hospital. Here renewed attempts were made to extract the knife, but a strong policeman only succeed in pulling off the handle, so that it became necessary to administer an anaesthetic and call in the service of a machinist with a vise be-

fore the blade could be removed. The blade had entered the orbit 75 mm., penetrating between the globe and inner wall. The patient was suffering much from shock—pulse very feeble. After removal of the knife the eye presented a clean-cut wound 25 mm. long, beginning 5 mm. above the inner canthus and extending downward and outward to a point near the center of the lower lid, which was divided. The globe was protruding and immobile; the pupil was dilated and fixed. On account of orbital cellulitis and inflammation of the globe, with much pain, the eye was removed on the third day after the injury. The wound healed and the patient was discharged twenty days after admission.

4. Albucasis (*Methodus Medendi*, lib. II, cap. XC, IV, p. 166, Basilees, 1541) reports the cases of two patients from whom he removed with difficulty arrow points which had deeply imbedded themselves in the orbital wall.

5. Horstius (*Observation 1*, op. 2, p. 226, Norimberg, 1660). The point of an arrow had remained imbedded in the bony wall of the orbit for 30 years without causing any disturbance. Then a catarrhal fever developed, during which the arrow point entered the nose and passing over the soft palate into the pharynx, was expelled through the mouth.

6. Marchetti (*Observation Sylloge*, obs. 23, Londini, 1729). A fragment of the handle of a fan, three inches long entered the inner angle of the orbit and broke into several pieces. Some of these pieces were removed at the time of the accident. Three months later a swelling appeared over the alveolar process. Incision revealed a large fragment of the fan handle, which was readily removed.

7. Fielding (*Philosophical Transactions*, Vol. V, p. 203, London, 1731). "One of the most remarkable cases of a ball penetrating through the orbit, and making its way out of the head, is that of Dr. Fielding, who was shot at the battle of Newberry, in the time of the Civil Wars. The ball entered the right orbit and passed inward. After 30 years residence in the parts, and a variety of exfoliations from the wound, nose and mouth, and the formation of several swellings about the jaw, it was at last cut out near the pomum Adami."

8. Morse (*Philosophical Transactions*, Vol. XLV, p. 520, London, 1748). A piece of lette (pottery?) had entered the nasal portion of the orbit of a laborer some two and a half inches and broken off. It was removed intact, but constant headache continued.

9. White, Charles (*Cases in Surgery*, p. 131, London, 1771). A pipestem penetrated the lower lid near its median line. There was no external evidence of the presence of a foreign body, and after replacing the dislocated globe by external manipulation there was complete restoration of the vision, which had been totally lost at the time of the accident. For two years the patient continued to be constantly annoyed by the odor of tobacco, when, during a violent attack of coughing, a piece of pipe stem, 5 cm. long was expelled through the mouth, followed six week later by another piece $2\frac{1}{2}$ cm. long, expelled under similar circumstances.

10. Percy (*Manuel du Chirurgien d'Armée*, p. 111, Paris, 1792) was obliged to remove the eye of a fencing master in order to extract a rapier blade which had penetrated deeply into the orbit. The patient died several months later, but not as a result of the injury.

11. Bell (*System of Operative Surgery*, Vol. LV, p. 162, London, 1807) removed a pointed piece of iron from the floor of the orbit. The globe returned to its original position and vision was preserved.

12. Beer (*Lehre von der Augenkr.*, Wien, 1813) A student, 19 years of age, had been struck by a fellow student in the outer canthus of the eye with the stem of a tobacco pipe. When he presented himself before Beer a marked exophthalmus and convergence were evident. All concerned were of the opinion that the pipe stem had been withdrawn intact. Notwithstanding this, Beer extracted a piece of pipe stem 2.25 cm. long. The eye returned to its normal position but the movement of the globe toward the temporal side remained imperfect.

13. Démours (*Traité des Maladies*, Tome II, p. 45, Paris, 1818). The point of a spindle entered the orbit to the depth of 2 inches between the globe and the inner orbital wall. Immediate attempts at extraction were unsuccessful. After one month the foreign body loosened spontaneously and was

readily extracted. Shortly after, however, the patient was attacked with violent convulsions and died.

14. Robertson (Mackenzie, *Traité des Maladies de l'Oeil*, Tome I, p. 435, Paris, 1830). A piece of straw entered the orbit where it separated into several pieces. Three months later a granulating fistulous opening in the region of the caruncle was incised and, one after another, three pieces of straw, each one inch long, were removed.

15. Fisher, N. (*Klin. Unterricht*, p. 32, Prag, 1832). A file entered the upper part of the left orbit and was broken off, followed by unconsciousness on the part of the patient. Probing revealed the foreign body deeply situated under the orbital margin. After repeated fruitless efforts at removal, it was finally removed on the fourth day by the aid of a powerful pair of forceps through the wound of entrance. It was found to be a three-cornered piece of file one and one-half inches long. A probe could be passed along the orbital roof for some five inches. The wound continued to discharge pus for some five weeks. Recovery was slow and was followed by permanent ptosis and a cloudy and atrophic cornea.

16. Alcock (*The Lancet*, London, February 11, 1832). Nine days after reception of the injury, Alcock removed from the orbit a 2-inch-long piece of clay pipe. Death occurred on the following day. Upon post-mortem examination there was found in the left cavernous sinus a piece of pipestem one inch long, imbedded between the *N. abducens* and the *A. carotis cerebralis*. The original three-inch long pipestem had broken in two, one piece remaining in the orbit, the other entering the brain cavity through the spheno-orbital fissure.

17. Holbig (*Allg. Med. Zeitung*, January, 1835). Five months after an injury two protuberances the size of green peas developed slowly between the lower lid and the globe, discharging finally by eight abscess openings. Probing revealed a rough foreign body, which, upon extraction, proved to be a piece of willow wood one and one-half inches long and three-quarters of an inch broad. The ultimate result was favorable.

18. Paccoud (reported by Carron du Villards, *Handbuch der Augenkr.*, 1840) removed a piece of wood two and one-fourth inches long which had been imbedded upon the orbital

floor for more than one year and had caused repeated evacuations of pus.

19. Neumann (*Casper's Wochenschrift*, 1845). A pine twig entered the orbit between the globe and the lower lid. The accident was followed by a fainting attack after which there was removed a piece of wood one and one-half inches long and three inches thick. Two days later, without any premonitory signs, sudden death occurred. Post-mortem there was found a piece of pine bark about 5 millimeters in diameter which had become detached from the twig and remained behind in the brain. The large wing of the sphenoid was perforated and the brain and meninges were inflamed.

20. Gintrac (*Gazette Medic. de Paris*, 1847, p. 730). A knife-blade was firmly imbedded in the orbital portion of the frontal bone, having entered between the globe and upper lid. The patient was unconscious and the pulse barely perceptible. After exerting much force, Gintrac extracted the blade which measured 5 cm. long and 1 cm. broad. The point of the knife must have entered the left anterior lobe about 18 mm. Recovery was speedy and complete.

21. Nelaton (*Archives d'Ophthal.*, Paris, 1854). Three years before presenting himself at Nelaton's clinic for the relief of a lachrymal fistula, the patient had received an injury of the inner canthus of the left eye. Nelaton discovered, upon probing, a smooth hard body, which proved, upon extraction, to be a piece of an ivory handle 4 cm. long and $1\frac{1}{2}$ cm. in diameter. The extraction was followed by profuse haemorrhage from the right nostril. The fistulous opening healed rapidly. There was also improvement of the defective vision.

22. Gendron (*Traité des Maladies des Yeux*, Tome I, p. 158, Paris, 1854, quoting from Desmarres). A soldier was wounded in 1814 by a piece of canister passing through the upper lid. After the lapse of eighteen years an abscess developed below the old scar causing a fistulous opening which led to a foreign body. In 1832 the surgeon removed a piece of iron one inch in diameter which was resting with its concave surface upon the globe and superior rectus; the convex side turned toward the roof of the orbit.

23. Desmarres (*Traité des Maladies des Yeux*, Paris, 1854) removed a piece of wood 2 cm. long from the nasal

side of the orbit two years after an injury, inflammation having developed shortly before the extraction.

24. Faber (*Würtemberg Corr. Blätt.*, 1854, No. 31). A piece of a branch of a tree had penetrated the lower lid close to the inner canthus and had broken off. Upon extraction, it was found to measure three and a third inches in length and one-third of an inch in thickness. The accident was followed by cerebral symptoms of four days' duration, at the end of which time pus and several pieces of bark were expelled from the wound. Four weeks later the wound was still granulating, but the patient refused further operative interference.

25. Jaeger, Ed. (*Weber, Staar und Staar Operationen*, Wien, 1854, p. 71). A lady, while watching an exhibition of fireworks, was struck in the eye by a descending rocket-stick, causing her to lose consciousness. The physician who was summoned detected only a superficial wound of the lids, but later, as pain and fever developed, Jaeger was called and detected, upon palpation, a foreign body in the orbit under the globe. It was extracted and proved to be a fragment of wood two inches long and one-half inch thick.

26. Jaeger Ed. (*Weber, Staar und Staar Operationen*, Wien, 1854, p. 69). A fragment of the mouthpiece of a tobacco pipe, one inch long and four lines thick, which had lodged for one year under the orbital roof, causing exophthalmus and corneal irritation, was successfully removed.

27. Von Graefe (*Archiv. f. Ophthal.*, II, 1, 233, 1855). Injury to the eye from the explosion of a guncap. There was a small crust on the upper lid which closed the outlet of a fistulous canal. A probe passed in three-quarters of an inch caused the evacuation of thick pus. The wound was enlarged and part of the exploded cap was removed. Rapid recovery followed.

28. Cappalletti (*Traité des Maladies de l'oeil. Trad. par Martomont et Festelni*, Paris, 1856). Removal of a fragment of the bony handle of a knitting needle one and one half inches long, which had remained in the orbit two months before inflammatory symptoms developed.

29. Blanchet (*Séance de l'Academie de 13 Novr.*, 1858) relates the history of a case in which a piece of glass 15 mm. broad and 1 cm. long had remained nine years under the

globe near the internal rectus, the sharp point almost reaching the optic nerve.

30. Demarquay (*L'Union Med.*, 1859, No. 129). An abscess formed in the upper lid from a piece of wood 2 cm. long and the thickness of a crow quill, which had been imbedded there two years before.

31. Rothmund (*Deutsche Klin.*, 1859, No. 16) discovered accidentally a black object near the inner canthus of the right eye of a peasant girl. Upon extraction this proved to be a fragment of a knitting needle two inches long. This must have entered the orbit some seven years before while she was falling down stairs.

32. Demarquay (*L'Union Med.*, No. 123, 1859). After an injury, complicated with facial erysipelas, the patient suffered from phthisis bulbi. Three months later Demarquay extracted a cone-shaped piece of wood 5.5 cm. in circumference and 5 cm. long. The position of this *corpus alienum* was obliquely from the outer margin of the orbit inward and backward.

33. Branzeau (*Gaz. Med. d'Orient*, Avril, 1862) extracted a piece of pipestem one and a half inches long, which had entered the orbit of a sailor three months before.

34. Rothmund (*Bayr. Intellig.* B. 1, 26, 1863) reports the case of a girl who complained of defective vision and ptosis of the left eye. He found a piece of straw three-quarters of an inch long imbedded in the inner canthus.

35. Rau (*Zander u. Geissler d. Verletz. des Auges*, p. 233, 1864) found "back of the conjunctival sac" a piece of tobacco pipe one and a half inches long which had been imbedded there six months.

36. Norman (*Medical Gazette*, Vol. I, p. 310, London, 1864) reports an injury to the left eye by the explosion of a stone bottle filled with powder. Six months later, by the aid of a pair of forceps and the exertion of considerable force, he extracted a piece of the bottle, one and a half inches long, three-quarters of an inch broad and a quarter of an inch thick, which had been firmly imbedded in the roof of the orbit.

37. Sabatier (*Zander u. Geissler d. Verletz. des Auges*, p. 244, 1864) removed, after four hours of continuous effort, a

piece of knife blade which had penetrated through the upper lid. It was necessary to fix the handle of the extracting forceps in a vise before sufficient force could be exerted to liberate the foreign body.

38. Beer (*Ibid.*, p. 243, 1864) extracted a fork which had penetrated the roof of the orbit, causing convulsions. Recovery was complete.

39. Günther (*Ibid.*, p. 239, 1864). A piece of wood entered at the inner angle of the orbit; the accident was followed by convulsions. The removal of the foreign body was accompanied by free haemorrhage; death one day later. Section revealed that the wood had passed through the fissura supra-orbitalis into the brain.

40. Pagenstecher (*Klin. Monats. f. Augenheil.*, 1864)

41. Clarke (Lawson, *Injuries of the Eye, etc.*, p. 323, London, 1867). An iron hat-peg three inches long entered the orbit of an old man while falling down a flight of stairs. The foreign body was so firmly imbedded in the bony wall of the orbit that much force was required to extract it. Recovery was complete.

42. Bowman (*Ibid.*, p. 330, 1867). A piece of rush grass one and a half inches long entered the orbit under the globe, instantaneous blindness resulting. It was removed one month after the injury.

43. Hulke (— — — April 20, 1867). Injury from the stem of a clay pipe. The patient had himself extracted a piece before reporting to the surgeon. Three days later probing revealed another piece in the region of the external rectus which, upon extraction, proved to be one-third of an-inch long. Recovery was complete.

44. Hulke (Lawson, *Injuries of the Eye, etc.*, Philadelphia, 1867). A charwoman, 21 years of age, had been struck on the right eye by a clothes-line prop. Three days later she exhibited symptoms of tetanus. On admission to the Middlesex Hospital there was œdema, exophthalmus, ulcer of the cornea and swelling of the temporal and maseteric regions. There was right facial paralysis. Death occurred 24 hours after admission. Post-mortem.—The dura and brain were found healthy; in the orbit there was extravasated blood and an abscess between the outer wall and the

globe which contained an irregular piece of wood 1" long and $1\frac{1}{4}$ " wide, and several other small pieces.

45. Gendron (*Traité des Maladies des Yeux*, Paris, 1870). A foreign body penetrated the inner canthus to the depth of two inches. The globe was not injured; vision, however, was virtually lost. Much swelling developed and two days later the foreign body was removed but the eye remained blind. The optic nerve had probably been severed at its point of entrance.

46. Saemisch (*Klin. Monats. f. Augenheil.*, pp. 51-56, 1871). Gunshot wound of the orbit without injury to the globe. Fluctuating swelling of the lower lid. Incision opened a pus cavity from which a Chassepot bullet was removed.

47. Haltenhof (*Annales d'Oculist*, Tome LXXI, Mars, Avril, 1874). A swelling the size of a hazelnut had existed for two years below the supra-orbital margin. It ruptured spontaneously and from the wound was extracted a piece of wood 1 cm. long and several mm. in diameter.

48. (Grain de plomb ayant traversé la paupière supérieure contusant le globe de l'œil. *Recueil d'Opthal.*, p. 155, 1875) A small wound under the superior orbital margin through which a bird shot had entered four days before and completely encircled the globe (?). It was readily extracted.

49. Lussier, J. E. (*Corps étranger dans l'orbite*. *Ibid.*, p. 94, 1875). While probing what resembled a lachrymal fistula following an injury five weeks previously, Lussier found a foreign body which, upon extraction, proved to be a splinter of wood the thickness of a crow-quill and two and a half inches long. The wound healed promptly.

50. (Injury of the Globe and Orbit. *Monats. f. Augenheil.*, p. 107, 1876). Removal of a piece of broken twig from the orbit through the suppurating wound of entrance in the upper lid near the outer canthus.

51. Lyster (*Lancet*, p. 423, London, 1876). Removal of a piece of pipestem one inch in length from the inner angle of the orbit six months after injury.

52. Haasis (*Betz Memorabilien*, No. XI, 1876). Stab-wound of the orbit on the temporal side of the globe. Examination revealed at a depth of one cm. a metallic substance which, upon extraction by the aid of a specially pre-

pared instrument, proved to be piece of knife blade six cm. long.

53. Lawson (*Lancet*, September 15, 1877, London). A splinter of wood entered the orbit of a child causing total blindness and paralysis of all the ocular muscles. Extraction was followed by recovery of the muscles but the blindness was permanent.

54. Falch, Heinrich (*Fremde Körper in der Orbita*, Greifswald, 1879). The patient was a young man who had been stabbed during a brawl four months before entering the hospital. The wound beginning above the left brow had passed downward through the upper lid and, though the globe was normal, a linear antero-posterior scar is seen upon everting the lower lid. The patient entered the clinic to obtain relief from lachrymation and pain. An incision revealed a metallic substance projecting three or four millimeters through the floor into the orbit. After using much force, the foreign body was released and proved to be a knife-blade 35 mm. long and 15 mm. broad, nearly all of the blade having entered the antrum of Highmore. Complete recovery followed and the eye remained normal.

55. Jordan, Furneaux (quoted by Treves' *Surgical Applied Anatomy*, p. 45, 1892). A man who was employed in threshing became the subject of severe ophthalmia. At the expiration of several weeks the patient, whilst pressing his finger on the lower lid, suddenly ejected from a bed of warm pus a grain of wheat which had shot forth a green sprout.

56. Johnson, Walter B. (*Trans. Amer. Ophthal. Society*, 1894). In 1886, a boy, 14 years of age, fell from a tree upon a number of dead cherry branches, receiving lacerated wounds of the forehead and a punctured wound of the left upper lid. The wound in the lid was promptly sutured by a physician of the neighborhood. For one week he suffered from great œdema of the lids, ptosis, exophthalmus, and severe pains, at the end of which time he was etherized by Johnson. On palpation, a hard substance was discovered under the upper lid immediately behind the scar of the punctured wound. The scar was incised and the foreign body, which proved to be a piece of cherry branch two and three-quarter inches in length and one-quarter of an inch in thickness, was removed, con-

siderable force being necessary to dislodge it. The accident was followed by optic nerve atrophy and evidence of injury to the third nerve.

57. Johnson, Walter B. (*Ibid*). A man, 49 years of age, was brought to the St. Joseph's Hospital, Paterson, N. J., after having received a severe blow in the eye in a saw-mill. The right lids and cheek were extensively lacerated, and there was a slight wound of the globe near the limbus on the nasal side. There was extensive intra-ocular haemorrhage. The patient was etherized and a foreign body situated half an inch behind the plane of the eyeball was easily removed. Six days later, sepsis, panophthalmitis, orbital cellulitis, and meningitis developed and the patient died on the twenty-third day after the accident. Post-mortem revealed an extensive fracture of the right orbital plate of the frontal, and extensive deposits of pus over the left convexity of the brain.

58. Johnson, Walter B. (*Ibid*). A boy, 8 years of age, was brought to the Paterson Eye and Infirmary with the history that two days previously, while running, he fell upon a piece of a stick, a large splinter penetrating the eyelid. A neighbor removed the splinter and in pulling it out was obliged to use great force. This was followed by pain, tumefaction of the eyelid, weakness, dizziness, vomiting, gradually increasing in severity. On examination, there was found some exophthalmus, subconjunctival ecchymosis, and chemosis of the ocular conjunctiva. On palpation, a foreign body was located deep in behind the point of the puncture. There was slight perception of light. The pupil was dilated and fixed. The lid was incised and the foreign body easily removed by a pair of forceps. It was a piece of pine wood one and one-quarter inches in length and about one-eighth inch in thickness. The wound healed kindly and quickly. In three weeks the vision =²⁰/_{xxx} and in two years =²⁰/_{xv}.

59. Johnson, Walter B. (*Ibid*). A man, 36 years of age. Premature discharge of a cannon loaded with powder and grass for a salute. Thirteen hours after the accident, in addition to other injuries, the eyelids were found swollen and perforated by bits of the stems of weeds and grass. The right globe had been penetrated but the left orbit contained more of the foreign bodies. The left contained two grains of powder. No

perception of light in either eye. Under ether, dozens of pieces of weeds, grass, and stubble were removed, some as much as one-eighth inch thick and one inch long. The right globe collapsed and serious inflammation threatened in both eyes. On the subsidence of the latter there developed phthisis bulbi of the right eye and an extensive rupture of the choroid could be determined in the left. Vision, R. E. = 0; L. E. = $^{10}/cc.$

60. Castle, C. H. (Personal Communication, December, 1899). In the summer of 1894 a man was brought to the Cincinnati Hospital, who betrayed no evidence of a wound of the eye or face except a slight splash of blood on the left cheek. He exhibited great difficulty in talking and an examination of his mouth revealed almost half an inch of a knife-blade projecting downward through the hard palate near the velum palati. The proximal end of the blade was found projecting from the floor of the left orbit, the foreign body having entered between the globe and the lower lid, the blow that had carried the knife having been directed downward and backward. Considerable difficulty was experienced in extracting it but recovery from the injury was prompt and uneventful.

61. Noyes (*Diseases of the Eye*). In May, 1882, a boy, 10 years of age, while playing soldier with a comrade and fencing with sharpened sticks, was wounded in the left orbit. The end of the stick broke off. He was not stunned nor did he feel much pain. He ran up one flight of stairs; and got his grandfather to pull out the piece with pliers. It measured two and one-half inches in length, tapered to a sharp point; at its base it was about one-fourth of an inch thick and was slightly bent at the distance of a quarter of an inch from the tip. Five hours later he was seen by Drs. Munn and Schoonover, who found the globe mobile, pupil dilated and fixed, no hemorrhage in conjunctiva or skin, no external lesion of the eye, but no perception of light. In twenty-four hours, I saw the patient and found the wound at the inferior temporal angle of the orbit, and almost no reaction, no exophthalmus. Pushing the globe deep into the orbit caused pain, but movements of the eye were painless and perfect. Pupil between 4 and 5 mm. in diameter, slightly larger than the other and would neither dilate nor contract. No sensation

of light. No photophobia in other eye. By ophthalmoscope, the nerve is intensely red, a little swollen, veins very turgid. The next day the color of the nerve was normal and vessels of usual size. After ten days the temporal side of the nerve was pallid. After four weeks the nerve became pale over the whole disc, and the vessels remained normal in size. No serious symptoms occurred at any period, although he became quite excited from anxiety during the first few days of his confinement to bed. It seems clear that the optic nerve was penetrated near the apex of the orbit, perhaps only severely contused. The lesion was behind the entrance of the arteria centralis, and no other organ save the optic nerve was damaged. Probably the bony walls escaped injury, and it is likely that the nerve was hurt very near the optic canal.

62. Noyes (*Diseases of the Eye*). A man walking among some bushes felt a twig strike his eye, and was convinced that a piece of it had found entrance. Some bleeding occurred; he suffered considerable pain; he found his sight uninjured, and for some time he did not go to a physician. A chronic inflammation lingered about the lower part of the eye, and he was annoyed by some pain and discomfort. The physician looked at the inflamed part and exerted the lower lid, but could see no signs of wound or scar and prescribed for what he regarded as simple conjunctivitis. The man's statement, that a foreign body had entered or was present in the orbit, he did not credit. For two weeks treatment by astringents was kept up, when I was called to see the patient. I discovered in the inferior cul-de-sac a small projecting granulation, as large as a No. 2 shot, and around this the conjunctival and scleral hyperæmia concentrated. I at once assumed that there was a foreign body in the orbit and advised its removal. For two weeks longer the same medical treatment was continued, and then the patient was put into my care at the New York Eye and Ear Infirmary. No trace of an offending substance could be felt with the finger, nor could a probe be forced through the tissues. The patient was etherized; an opening was made into the conjunctiva at the granulation, and by tearing and stretching the tissues an opening was made large enough for the entrance of my little finger. Afterward my index finger was thrust in. No foreign body could

be felt, nor could any sign of it be found by various exploring and grasping instruments. After prolonged manipulation, while with the finger pressed deeply into the orbit, I was also feeling along it with a pair of dressing forceps, I caught something which conveyed the sensation of a foreign body. Drawing upon it, I brought forth a bit of twig about one and one-eighth inches long, and as large as Theobald's lachrymal probe No. 8. It was softened by long maceration, was flexible, and offered so little resistance that its detection was rendered extraordinarily difficult. The yielding nature of the orbital contents greatly increases the difficulty of seizing a foreign body unless it have some stiffness or can be steadied by being pressed against the walls. The operation gave rise to no serious trouble and in ten days the man was discharged cured.

63. Taylor, Louis H. (*Archives of Ophthalmology*, Vol. XV, No. 3, 1886). A boy, while playing, fell forcibly forward upon the floor striking his head upon a penholder which he held in his hand. This latter ran upward into the left nostril and there broke off. A physician removed it, securing three pieces. Three weeks later the tissues around the left eye were swollen, hardened, and painful. The lids were swollen tightly shut although there was exophthalmus, and there was a purulent discharge. In separating the lids a black object presented and was extracted and proved to be a piece of the penholder. It was $1\frac{1}{16}$ " long and $\frac{1}{8}$ " in diameter. After appropriate treatment, recovery was complete and perfect, leaving no defect in eye or nose.

64. Jeaffreson (*London Ophthalmic Hospital Reports*, Vol. VII, 1871). A lad, 13 years of age, presented himself with a cystic tumor at the inner margin of the orbit, which had developed since he had struck his head against a tree, while running, some months ago. On incision, curdy pus was evacuated. No foreign body could be found. The wound was packed to favor repair from the bottom up. Ten days later something black projected into the wound and on removal was found to be a splinter of wood almost an inch in length and the thickness of a small penholder.

65. Mackenzie (*Diseases of the Eye*, London, 1896, p. 20). Dr. Hennon mentions the case of a soldier, who was brought

to him some weeks after being wounded, for the purpose of having a ball extracted, which gave him excessive pain, impeded his respiration and deglutition, prevented his speaking distinctly, and kept up an irritation in his fauces, attended with a constant flow of saliva, and a very frequent inclination to vomit. On examination, it was found to be lodged in the posterior part of the fauces, forming a tumor behind, and nearly in contact with the velum pendulum. It had passed in at the internal canthus of the eye, fracturing the bone. Although blindness was the instant effect, the globe of the eye was not destroyed, and the remaining cicatrix and the very inflamed state of the organ were the only proofs that an extraneous body had passed near it.

66. Mackenzie (*Diseases of the Eye*, London, 1896). A soldier of one of Napoleon's armies was struck just above the left orbit by a musket-ball, but as a fellow soldier fell dead at the same time by his side, he believed the ball had rebounded from his own head and killed his comrade. For more than twenty-four years he was subject to violent pains in the left eye and in the head, and this eye projected much from the orbit. The surgeons under whose care he had been placed from time to time, believing his story of the rebounding of the ball, afforded him little or no relief. In 1837 he came to the hospital at Verona, when Dr. De Borsò, on examining the patient, came to the conclusion that the projection of the eye, which commenced soon after the accident, could be caused only by the persistence of a foreign body in the orbit, as any exfoliation of bone which the blow might have occasioned would, in the course of so many years, have been discharged or absorbed. A portion of the bone was, therefore, removed from the orbit by the trephine. The track of the ball was found ossified, excepting at a small aperture, whence issued from time to time a little fluid. After the bone was removed, the ball was felt, by means of a probe, at the back of the orbit and extracted by means of a forceps. The eye now retreated into the orbit and after some weeks became atrophic. The violent pains were quite relieved and the patient lived for five years, to die then of pleuro-pneumonia. On examination, it was found that the cranial cavity had not been penetrated by the trephine, but opposite to

where the bone had been removed was a deposit of osseous substance.

67. Mackenzie (*Diseases of the Eye*, London, 1896). Nicholas Joseph Brune, 17 years of age, wishing to unload a musket, began by extricating the balls with the common screw used for that purpose, but was foiled in attempting to remove the paper and powder. He tried in vain to make the piece go off, priming it repeatedly for that purpose. At last he resolved to bring the thick end of the ramrod to a strong heat, and introduce it into the barrel of the gun. The instant this was done the powder exploded and the ramrod was driven against the inner part of Brune's right orbit, where the os unguis is united to the nasal process of the superior maxillary bone. Directing its course upward and backward, it came out by the right side of the superior angle of the occipital bone, to the length of ten inches. On hearing the explosion the father ran in terror to the assistance of his son who had fallen to the ground. He instantly raised him, and seizing the thick end of the ramrod with both hands, drew it out of his head. About two ounces of blood flowed from the two openings, whence escaped also some portions of the brain. A surgeon dressed the wound, enjoined abstinence, but did not bleed. No bad symptoms occurred except that the right eye became violently inflamed and was lost. A considerable quantity of pus came from the wounds, and between the thirty-sixth and fifty-second days some small exfoliations were discharged. Three months after the accident, the cicatrization was complete. Professor Ansiaux afterwards repeatedly examined the patient and exhibited him to his pupils. His health was perfect, and he was able to labor at hard work.

68. Mr. Poland (*London Ophthalmic Hospital Reports*, Vol. II, p. 216, 1860). A boy, 10 years of age, while returning from school and carrying his slate and slate pencil in his hand, tripped and fell, breaking his pencil and receiving a small wound in the upper lid below the eyebrow. Careful examination failed to reveal that any portion of the pencil had been left in the wound, and it was supposed to have been lost at the place of accident. Some strapping was applied and no further notice taken. After a few days, inflammation

of the upper lid and constitutional disturbance, with pain and protrusion of the eyeball. Entered Moorfields. Examination negative, but a deep incision revealed the lost piece of pencil, which was extracted, and complete recovery followed.

DISCUSSION.

DR. B. E. FRYER (Kansas City, Mo.).—Every ophthalmologist, yes, and every rhinologist also, is interested in the paper by Dr. Holmes, who is to be thanked for his excellent account of these injuries.

I would refer to a case of injury to the orbit with retention of a foreign body. The case was that of a negro boy, about 6 years of age, and the only history of the injury I could obtain was that he had some six months before fallen onto a piece of cordwood which struck the orbital edge and made but a slight wound. There appeared to be a bony tumor of orbit, the eyeball was projected forwards, outwards, and downwards. I prepared for the operative removal of this, but cutting down I found a cartilage-like elevation and on cutting away a part of this, found pus and a piece of wood about three-fourths of an inch long by one-fourth of an inch thick. This was removed and the patient cured, the eye being saved.

A second case was that of a young man, 16 years of age. A piece of copper cartridge was supposed to have struck the eye and wounded it. The eye was sightless and the media were cloudy. Enucleation was done, but the eyeball was found uninjured by the offending foreign body, which later was found to be a piece of percussion cap.

Further remarks were made by Dr. W. L. Ballenger, of Chicago, Ill., who related a case of tolerance of a foreign body in the orbit for something like thirty years.

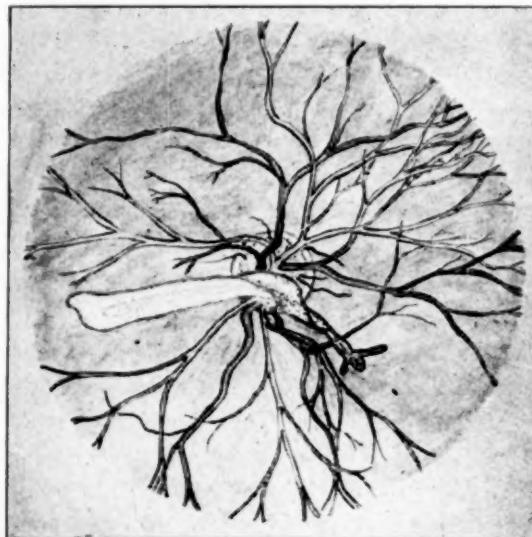
A CASE OF PERSISTENT HYALOID ARTERY ASSOCIATED WITH AN UNUSUAL OUTGROWTH FROM THE OPTIC DISC EXTENDING OVER THE MACULAR REGION.

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THE case is that of a young girl, 13 years of age, who was seen by me at the Johns Hopkins Dispensary, November 11, 1899. She complained simply of asthenopic symptoms. Ophthalmoscopic examination showed about 4 D. of hypermetropia in each eye; the left eye otherwise was normal, but



the right eye presented to view a very unusual condition. Growing from the optic disc and extending nearly to the lower part of the lens was a strand of tissue which was undoubtedly the remains of the hyaloid artery. Arising also from the optic disc but extending outward over the retina and completely hiding from view the macular region, there was a club-shaped band of tissue almost snowy-white in ap-

pearance. The accompanying sketch shows fairly well the shape and position of this band, but it is impossible of course to reproduce exactly the appearance of the persistent hyaloid artery, since the latter extended directly out into the vitreous humor.

On the optic disc the band of tissue could be seen to be connected with the persistent hyaloid artery. At the macular region it seemed to be firmly united to the retina and no appreciable parallactic movement could be obtained. Nearer to the optic disc such a movement could be produced, but this was due to the fact that the band was thicker there. There was a faint reddish streak in the middle of the band, probably due to the retinal reflex showing through.

The best vision obtainable was $20/200$ and as was to be expected, there was an absence of central vision, it being necessary for the patient to turn the eye either inward or outward in order to see objects placed directly in front of the latter. An upward or downward movement, no doubt, would have sufficed but she preferred to turn the eye inward. There was a decided convergent squint of the right eye, due, no doubt, to the hypermetropia and to the lack of central vision. On covering the left eye the right eye turned further inward instead of outward, as is ordinarily the case. This additional movement was undoubtedly necessary in order to remove the opaque band from the retinal image of the object regarded.

In looking over the literature I have not been able to find mention of a case which strictly could be called similar. C. Bader¹ reported several cases of outgrowths extending from the optic disc, and for a short distance upon the retina, but none of the cases was associated with a persistent hyaloid artery nor was vision interfered with by the growth. Bader attributed the outgrowths "to white opaque tissue connecting the retinal elements and the optic nerve-fibres (similar to the connective tissue in the optic nerve outside the eye)". B. A. Randall² pictured a case in which an outgrowth from the

¹ Guy's Hospital Reports, 1872, Vol. XVII, p. 473.

² Transactions of the American Ophthalmological Society, 1888, Vol. V, Part I, p. 116.

optic disc extended 6 to 8 D. into the vitreous humor. In shape it somewhat resembled the growth in this case. It was not associated with a persistent hyaloid artery.

The most plausible explanation of the occurrence of this outgrowth seemed to be that it was part of the persistent hyaloid artery, perhaps its sheath, which early had become adherent to the retina.

EXPERIENCE WITH PROTARGOL IN OPHTHALMIC PRACTICE.

BY GEO. A. GOODE, M.D.,

PITTSBURG, PA.

THE past ten or fifteen years have been rather remarkable for the development of new therapeutic agencies. All of them, when first presented to the profession, offered great things, and it was thought in each instance that a long-felt want was met; as, for example, in the development of the coal-tar derivatives, which should relieve pain and reduce high temperatures. Careful and sufficient employment of these novelties has resulted in the complete abandonment of some and the limited use of others. Among those which have passed through the experimental stages and yielded results sufficient to warrant for them a place in the *materia medica*, is protargol.

With regard to ophthalmology, it certainly has proven to possess properties which produce results, at least equal to those attained by that long-tried friend, nitrate of silver.

Bacteriological experiments sufficiently prove the power of this remedy in destroying or checking the development of micro-organisms. This is also true of nitrate of silver, but its influence is more superficial than that of protargol, for the reason that the latter is not precipitated by albuminous substances. Experiments have fully shown a power of greater penetration into the tissues in favor of protargol. The application of nitrate of silver to an inflamed conjunctiva is fol-

lowed almost immediately by the formation of a grayish membrane upon the surface—the albuminate of silver. This combination, together with the neutralizing influence of the chloride of sodium in the tears, helps to limit its bactericidal power, and it thus fails to reach the microbes which lurk beneath the surface.

Protargol has some other points which make it preferable. Pain is produced by the application of nitrate of silver in even weak solution. There is little discomfort caused by protargol in strong solution.

Personal observation has shown that this remedy is valuable in all cases where the nitrate of silver has been so long indicated. I have employed it in purulent ophthalmia of the adult as well as of the infant. In this disease there is this advantage in its favor, viz.: It may be more frequently, and is more easily applied than the nitrate of silver. No one but a skilled person should be entrusted with the nitrate, and its application is but rarely justifiable oftener than once in twenty-four hours. Protargol is safe in the hands of anyone and may be frequently instilled with a dropper.

Several cases of chronic granular conjunctivitis, after a comparatively short period of treatment, were cured. Some of these had been under observation for some time and treated with the old line of remedies.

In the treatment of blennorrhœa of the tear-sac I have found it very valuable. After performing the usual stricture operation, the injection of a solution (1 to 2 percent.) is followed by a most decided diminution in the secretion of pus.

In ulceration of the cornea, its use has proven beneficial.

It has been claimed that argyrosis is not produced by protargol. However, it has been my experience to have two cases of staining of the conjunctiva from it, as marked as any that I have seen from the nitrate of silver.

ABSTRACTS FROM MEDICAL LITERATURE.

BY W. A. SHOEMAKER, M.D.,

ST. LOUIS, MO.

THE NEURON OF THE CILIARY GANGLION AND THE CENTERS OF THE MOVEMENTS OF THE PUPILS—AN EXPERIMENTAL STUDY.

Marina (*Deutsche Zeitschrift für Nervenheilkunde*) discusses the results of the investigations upon the anatomy of the ciliary ganglion, which seem to have led to very divergent results; some observers claiming that it is analogous to the ganglion of the spinal nerves, and others to the ganglion of the sympathetic system, and reports the results of his own experiments, which had for their object the elucidation, if possible, of this point. The experiments of injuries to various portions of the contents of the orbit, in order to produce secondary changes in the ganglion. After a certain time, the animal, usually a dog or an ape, was killed, the ganglion rapidly dissected out and hardened in a mixture of 95 per cent. alcohol, 100 parts; chromic acid, 1 part; and formalin, 5 parts. Staining was accomplished either with thionin or methylene blue. In the first animal the ciliary nerves were cut; eleven days later no cells in the ganglion on that side were normal. There was slight degeneration in the cells of the other ganglion. In the second animal the cornea was cauterized; twelve days later many of the cells of the operated side showed partial chromatolysis. In the third animal, twelve days after exenteration of the bulb, it was found that the nerves and ganglion were in an advanced stage of degeneration.

A series of experiments were performed upon apes, and it was found that *neurectomy caused degeneration in the ganglion*; cauterization more degeneration; the removal of the ciliary processes a pronounced degeneration, that could be traced to the Gasserian ganglion, and the sympathetic ganglia of the neck. Finally, section of the optico-ciliary

nerves produced a profound degeneration in all of the cells of the ciliary ganglion, and a degeneration of certain groups of cells in the Gasserian ganglion, and the cervical region. He concludes that, as after cauterization of the cornea, about five-sixths of the cells degenerate, that a proportion of these are of a sensory nature; but, as after neurectomy, all of the cells are profoundly degenerated, a majority of them possess a motor function.

From this he draws the conclusion that in apes, at any rate, the majority of the cells in this ganglion are of sympathetic and not of a spinal nature.

THE EYE SYMPTOMS OF LOCOMOTOR ATAXIA, WITH A CLINICAL RECORD OF THIRTY CASES.

C. O. Hawthorne (*British Medical Journal*, March 3, 1900) believes, after a study of thirty cases, that he is justified in concluding that the existence of otherwise *unexplained ocular lesions* should arouse a suspicion of locomotor ataxia. Either atrophy of the optic nerve, ocular paralysis, or Argyll-Robertson pupil may exist for a long time as an isolated symptom. If more than one of these be found it is more probable that the cause is locomotor ataxia. Sometimes minor evidences of special disease may be found upon careful examination, and thus the suspicion is increased. At times, cases which have for a long time had only ocular symptoms suddenly and rapidly develop spinal symptoms of locomotor ataxia. But, although these ocular symptoms may arouse a suspicion of locomotor ataxia, the prognosis can not be established at once, as the eye symptoms may remain for years the only indication of the disease.

A CONTRIBUTION TO THE ETIOLOGY AND THERAPY OF EPISCLERITIS PERIODICA FUGAX.

W. Stöltzing (*Münchener Medicinische Wochenschrift*, February 13, 1900) cites a case of this kind and speaks of the therapy and etiology of the affection. Fuchs says therapy is for the most part without results, although quinine and sodium salicylate are the most effective. The author, in the reported case, found potassium iodide to exert a favorable influence. He also thinks there is no foundation for be-

lieving in a syphilitic etiology of the disease from the results of the iodide treatment, since all other symptoms of this affection are absent, and since the affection recurs soon, when the iodide is stopped. Syphilitic phenomena, if dispersed by iodide of potassium so perfectly and quickly, do not return in this manner.

THE ORIGIN OF SO-CALLED ACUTE CATARACTS.

I. I. Maslenikoff (*Vratch*, January 29 and February 5, 1900) reports a case of cataract occurring suddenly in a woman, 27 years of age, of sound physical condition, but suffering from an hysterical attack, and discusses the cases of sudden clouding of the lens during convulsions from other causes. The clouding is attributed by some to spasm of the ocular muscles.

ADVANCES IN THE SURGICAL TREATMENT OF STRABISMUS.

E. Landolt, Paris, (*Journal of the American Medical Association*, November 25, 1899) reiterates his well-known argument against the performance of tenotomy, and in favor of advancement in the surgical treatment of strabismus.

He reviews the etiology of strabismus, and gathers the following hints for its treatment:

1. Since binocular vision governs the normal direction of the eyes, it is the most important factor in the re-establishment of the normal direction, *i. e.*, the treatment of strabismus.
2. When binocular vision is lost, for instance, in amaurosis of one eye, we can not expect a satisfactory correction of squint; an operation can produce only a cosmetic effect.
3. When the vision is fairly good in both eyes, we must try by every means in our power to restore binocular vision, since it is our most powerful ally in the treatment of strabismus.
4. Since the relation between accommodation and convergence plays an important part in the associated movements of the eyes, we must make this association our aid in the treatment of strabismus, especially in convergent strabismus. We diminish convergence—*i. e.* excluding accommodation—with a cycloplegic and convex glasses.

5. Since strabismus soon brings about changes in the ocular muscles, these measures alone can give satisfactory results only in *recent* cases. When the strabismus has existed for a certain time, we have to modify, first of all, the oculo-muscular system of the patient. This is the object of *surgical interference*.

In convergent strabismus Landolt recommends advancing *both* external recti; reserving *tenotomy* for (1) such cases as are not fully corrected by the advancement, always waiting, however, until you see what the final result of the advancement is, and (2) cases of *vertical strabismus* with *diplopia*. In the latter class of cases we do not generally meet the muscular alterations which are the rule in ordinary strabismus. There is generally a strabismus of a *few degrees only*, and a *simple tenotomy*, without a marked recession of the muscle is enough to cure it.

In *heterophoria* the author rarely finds cases where operative interference is justified, and when it is, he prefers advancement of one muscle; reserving tenotomy for the cases with a marked increase of the negative part and only a moderate diminution of the positive part of the amplitude of convergence.

Landolt's experience teaches him that in *manifest* strabismus, advancement of the two muscles implicated never gives over-correction. In strabismus of *medium degree*, it is well even to increase the effect of the advancement by cutting off the tendinous end of the muscle. In strabismus of *very high degree*, or of old standing, this resection may well amount to 6 mm. in each muscle.

His method of operating for muscular advancement is as follows: Begin by cutting a conjunctival flap whose semicircle reaches the edge of the cornea (see Fig. 1). Fold it back so as to expose the insertion of the muscle to be advanced. Pass beneath the muscle a rather small and somewhat flattened muscle-hook, making sure that you get *all* of the muscle. Then introduce into the muscle, from without inward, two sutures, about one-third of the width of the muscle from each edge, including also in the sutures the surrounding tissues. In *simple advancement*, the sutures are introduced immediately behind the hook, and the muscle is detached

from its insertion at the ocular globe. If a *resection* is desired, the stitches are introduced further back and the muscle divided between them and the hook. The tendinous end is finally cut off from the eyeball. One of the needles is now passed above, the other below the meridian, into the *episcleral* tissue, close to the corneal margin (*a-b*, Fig. 1) to the extent of several millimeters. The assistant then seizes the ocular globe with a fixation forceps, at the level of the antagonist, and turns it toward the muscle to be advanced. In this way one can tie the stitches without exercising too great traction on the tissues. A *binocular dressing* is ap-

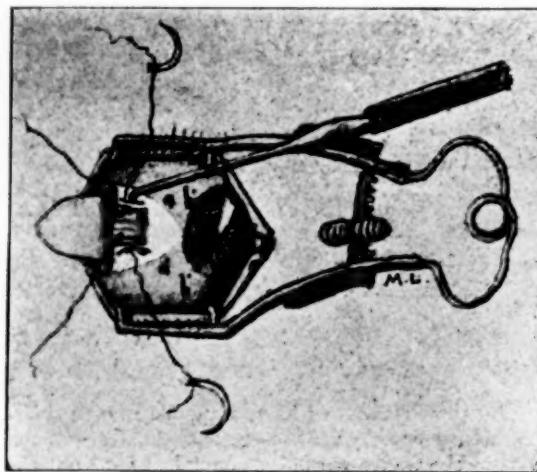


FIG. 1.—Landolt Method of Muscular Advancement.

plied, even if one eye only has been operated on. The dressing is renewed every twenty-four hours, and remains on five or six days in divergent, and about one week in convergent strabismus. The sutures are generally removed on the sixth day. It is most important that the eyes should be kept immobile and the patient calm and quiet.

As to the *re-establishment of binocular vision*, the main points are: 1. Restore to the eye which does not fix, its visual value by correcting carefully its optical defects, and by exercising it. 2. Cause the patient to perceive *simultaneously* the visual impressions of the two eyes—distant candle flame, colored glass before one of the eyes, prisms, etc. 3. Make

the macular impressions of the two eyes coincide and then fuse—prisms, Priestly Smith's fusion tube, stereoscopes, etc.

TOBACCO AMBLYOPIA.

Francis Dowling (*Journal of the American Medical Association*, February 24, 1900) gives the results of some recent examinations made to determine the influence of tobacco on vision among the employees of tobacco factories. He thinks that a tobacco-laden atmosphere is not enough to produce poisoning, so far as the eyes are concerned, but that these symptoms are the result of smoking or chewing.

THE SIGNIFICANCE OF INTRAOCULAR HÆMORRHAGE AS TO THE PROGNOSIS OF LIFE.

Charles Stedman Bull (*Medical Record*, February 3, 1900) concludes his article as follows:

1. Hæmorrhages into and beneath the conjunctiva are of little importance in the young, as they usually occur as a result of violent muscular effort, as in coughing or long-continued sneezing. The vessels in the conjunctiva, having little or no support in the loose connective tissue, readily give way to paroxysms of violent coughing. In the aged they occur spontaneously and point to a general weakened condition of the vascular walls.
2. Hæmorrhages in the interior of the eye are always of prognostic significance. In senile angiosclerosis retinal hæmorrhages are very frequent, and point significantly to the probable occurrence of cerebral apoplexy.
3. Recurrent retinal and subhyaloid hæmorrhages in the young are of slight prognostic importance, especially if due to syphilis, whether inherited or acquired.
4. Hæmorrhages in the vitreous, in the young, are of grave prognostic importance and point to the existence of general vascular degeneration.
5. In chronic interstitial nephritis and in diabetes retinal hæmorrhages are of very grave prognostic significance, and independently of the presence of exudative retinitis, point to a fatal termination of the disease. The mere presence of thrombosis of the central retinal vein with hæmorrhages in the retina should arouse suspicion of the existence

of albuminuria, and if this suspicion is confirmed by urinary analysis, the prognosis in the case is more unfavorable than in those cases in which the haemorrhages do not exist.

SARCOMA OF THE UVEAL TRACT.

C. D. Marshall (*Royal London Ophthalmic Hospital Reports*, Vol. XV, Part I) reports upon fifty-eight cases, all seen at the Royal London Ophthalmic Hospital since 1891. In fifty-six cases the eye only was enucleated, and in two, enucleation was followed in a few days by extirpation of the contents of the orbit. Of thirty-four of these patients known to be alive, eleven have lived from three to seven years without recurrence. Of twelve patients known to have died, six are known to have died of a recurrence of the disease. Marshall also carries on the history, so far as it could be learned, of the survivors of the one hundred and three cases reported by Lawford and Collins in 1891. Of these, six are known to be living without recurrence after periods of from 8 to 17 years. Of the fifty-eight patients that are known to have died, thirty-four died of a recurrence of the disease. In six cases the period of survival, before death from a recurrence of the growth, was from three to six years. The author says we should avoid drawing any arbitrary line, such as three years limit of recurrence.

BACTERICIDAL ACTION OF TEARS.

E. Valude, of Paris, (*Annales d'Oculistique*, September, 1899) has made an experimental and clinical study of the influence of the lachrymal secretion upon various pathogenic bacteria. He finds it a very poor culture medium for micro-organisms, and that it is capable of destroying the virulence of some of them; notably the bacillus of anthrax, the colon bacillus, and the yellow staphylococcus. Its influence upon the white staphylococcus was perceptible but less marked. He also found that an acid reaction of the tears marked a predisposition to post-operative infection. In eighty cases of cataract tested prior to the operation of extraction, three showed an acid reaction of the lachrymal secretion, and in these three cases healing was complicated by iritis more or less violent, although no eye was lost.